

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) Use of an A method for maintaining a non-differentiated state of stem cells, while allowing cell division of said stem cells, comprising administering to said stem cells an effective amount of an inhibitor of cell development in a controlled manner to maintain the non-differentiated state of stem cells, in particular human stem cells, while allowing their cell division.

2. (currently amended) Use of an inhibitor The method according to claim 1, in which wherein the stem cells are human cells chosen selected from the group consisting of embryonic stem cells at the origin of somatic stem cells, and/or the stem cells/somatic progenitors themselves at the origin of blood and/or various solid tissues, such as the skin, the liver, the pancreas, the heart, the kidney, bone or nerve tissue.

3. (currently amended) Use of an inhibitor The method according to claim 1, in which wherein the inhibitor of cell

development is ~~chosen~~ selected from the group consisting of products of genes which control cell development with respect to cell differentiation and/or cell division, inhibitors of cycline-dependent kinases, factors which control apoptosis or ageing, [[and]] cytokines, ~~(such as interferons, and TGF- β [[)])~~.

4. (currently amended) ~~Use of an inhibitor~~ The method according to claim 1, in sequential combination with an anti-inhibitor of cell proliferation, to initiate a number of cell divisions ranging from 1 to about 100, ~~in particular 1 to about 10, and in particular to initiate a single cell division,~~ while maintaining the non-differentiated state of stem cells, in particular human stem cells.

5. (currently amended) ~~Process~~ A process for the multiplication of stem cells in a culture medium, ~~in particular human stem cells, characterized in that it comprises comprising:~~
- ~~a stage in which the stem cells, in particular human stem cells, stimulating stem cells in the resting state so that said stem cells~~ are brought out of their resting state by neutralization ~~of the effect~~ of an inhibitor of cell development, ~~and in particular an inhibitor of cell proliferation, produced by the cells and/or present in the culture medium so that there is~~ initiation of a number of cell divisions ranging from 1 to about

100, ~~in particular 1 to about 10, and in particular a single cell division, and~~

~~- and a stage in which the stem cells, in particular human cells, obtained in the preceding stage are inhibited inhibiting said stem cells in their differentiation with the aid of an inhibitor of cell development.~~

6. (currently amended) Multiplication The
multiplication process according to claim 5, characterized in
that wherein at the end of the multiplication process the stem cells multiplied in this way are maintained in a non-differentiated state.

7. (currently amended) Multiplication The
multiplication process according to claim 5, characterized in
that wherein the stem cells are human cells ~~chosen selected~~ from the group consisting of embryonic stem cells at the origin of somatic stem cells and the somatic cells themselves at the origin of blood and/or various solid tissues, ~~such as the skin, the liver, the pancreas, the heart, the kidney, bone or nerve tissue.~~

8. (currently amended) Multiplication The
multiplication process according to claim 5, characterized in
that wherein the stem cells, ~~in particular human cells, are~~

present in a cell concentration of about 1 to about 10^{10} cells per ml, and in particular in a concentration ranging from about 10^3 to about 10^{10} cells per ml, and more particularly about 10^4 to about 10^9 cells per ml.

9. (currently amended) Multiplication The
multiplication process according to claim 5, characterized in
that wherein the inhibitor of cell development is synthesized by
the stem cells, in particular human stem cells, and/or is added
to the culture medium containing the stem cells, in particular
human stem cells.

10. (currently amended) Multiplication The
multiplication process according to claim 5, characterized in
that wherein the inhibitor of cell development is chosen from the
group consisting of products of genes which control cell
development with respect to cell differentiation and/or cell
division, inhibitors of cycline-dependent kinases, factors which
control apoptosis or ageing, and cytokines (such as interferons
and TGF- β).

11. (currently amended) Multiplication The
multiplication process according to claim 5, characterized in
that wherein the inhibitor of cell development is present in a

[[low]] concentration in the culture medium containing the stem cells, and in particular in a concentration ranging from about 10^{-10} mg/ml to 1 mg/ml.

12. Multiplication The multiplication process according to claim 5, characterized in that wherein the neutralization of the effect of the inhibitor of cell development, and in particular the inhibitor of cell proliferation, present in the culture medium is effected by

- addition to the culture medium, in a suitable amount, of an anti-inhibitor of cell proliferation, such as an anti-TGF- β , and/or
- withdrawal from the culture medium of the inhibitor of cell development, and in particular the inhibitor of cell proliferation, belonging in particular to the cytokine group.

13. (currently amended) Multiplication The multiplication process according to claim 5, characterized in that wherein the anti-inhibitor of cell proliferation is present in a concentration ranging from about 10^{-18} to about 10^{-3} g/ml.

14. (currently amended) Multiplication The multiplication process according to claim 5, in which wherein the culture medium contains hematopoietic stem cells or somatic stem

cells at the origin of skin and comprises one or more cytokines
~~(added to the culture medium)~~ chosen selected from the group
consisting of interleukins and CSF, [[the]] said cytokines being
present in a concentration ranging from about 10^{-8} $\mu\text{g}/\text{ml}$ to about
1 mg/ml , and ~~in particular about 10^{-5} $\mu\text{g}/\text{ml}$ to 0.1 $\mu\text{g}/\text{ml}$.~~

15. (currently amended) Multiplication The process
according to claim 5, characterized in that it comprises
comprising the following stages:

a) initiation of a first cycle of division of non-differentiated embryonic, [[or]] somatic stem cells or somatic
~~stem cells at the original of skin~~ in a culture medium, ~~and in~~ particular of hematopoietic somatic stem cells, by seeding non-differentiated embryonic or somatic stem cells in the resting state in a high initial cell concentration, ~~in particular in a~~ concentration ranging from 10^3 to 10^{10} cells per ml, in the presence of one or more cytokines, and by neutralization of the effect of the inhibitor of cell development, and ~~in particular~~ the inhibitor of cell proliferation, present in the culture medium so that the above-mentioned cells leave their resting state by the initiation of a first cell division,

b) return to resting of the non-differentiated embryonic or somatic stem cells obtained in the preceding stage with the aid of an inhibitor of cell development, [[the]] said

inhibitor being synthesized by [[the]] said stem cells or being added to the culture medium,

c) ~~if appropriate~~ optionally washing of the non-differentiated embryonic or somatic stem cells obtained in the preceding stage in order to remove the catabolites and the inhibitor of cell development, ~~and in particular the inhibitor of cell proliferation which may be present in the culture medium,~~

d) ~~if appropriate~~ dilution of optionally diluting the non-differentiated embryonic or somatic stem cells obtained in the preceding stage in order to maintain an optimum cell concentration ranging from about 100 to 10^{10} cells per ml,

e) successive repetition of the cycles of division and resting described above until the amplification factor of the cells is sufficient to obtain the number of desired stem cells, and ~~in particular 2 times to about 10^{12} times the number of initial non-differentiated embryonic or somatic stem cells,~~ which corresponds to a total duration of the multiplication process of about 1 day to 3 years, ~~and in particular 1 day to 15 days,~~

f) stopping of the multiplication of non-differentiated embryonic or somatic stem cells to store them, use them or cause them to differentiate *in vitro*.

16. (currently amended) Multiplication The
multiplication process according to claim 5, characterized in

~~that wherein the duration of a single resting state ranges from about 1 hour to 3 years, and is in particular about 6 hours to 72 hours, and in that the duration of a single division cycle ranges from about 6 hours to 3 years, and is in particular about 6 hours to 24 hours.~~

17. (currently amended) ~~Use of A method for reconstituting human blood and/or human solid tissue or organs, comprising administering non-differentiated and amplified human stem cells such as are obtained by the process of according to~~ claim 5 to reconstitute human blood and/or human solid tissue or organs.